

Using Social Networking in University Emergency Communications

Sara Cohen, MPP and Emergency Public Health 2008

Applied Policy Project, May 1, 2008

UCLA School of Public Affairs, Department of Public Policy

This report was prepared in partial fulfillment of the requirements for the Master in Public Policy degree in the Department of Public Policy at the University of California, Los Angeles. It was prepared at the direction of the UCLA Office of Emergency Management as a policy client. The views expressed herein are those of the author and not necessarily the Department, the UCLA School of Public Affairs, UCLA as a whole, or the UCLA Office of Emergency Management.

TABLE OF CONTENTS

Acknowledgements.....	3
I. Executive Summary.....	4
II. Current Events.....	5
III. Lessons Learned.....	7
IV. Social Networking.....	10
A Rise in Popularity.....	10
How Social Networking Works.....	14
Operational Dimensions.....	16
Potential Issues.....	26
Is Computer Ownership a Problem?.....	26
How to Reach the Disconnected User.....	27
V. Implementation and Design Choices.....	28
Choosing the Site.....	29
Profile Management and Responsibilities.....	30
Set Up and Profile Maintenance.....	31
Information Flow.....	32
Populating the Site.....	35
VI. The Future of Social Networking.....	37
VII. Summary of Recommendations.....	39
VII. References.....	41

ACKNOWLEDGEMENTS

I'd like to give recognition and thanks to the following people for their immense help and support throughout the nine months taken to complete this report. To my friend and boss, David Burns, CEM, Director of Emergency Management at UCLA, and my advisor, Professor Mark Kleiman; I could not have done this without you. To my friend and boss, Pamela Mottice-Muller, Director of Emergency Management for her never-ending friendship and guidance. To Assistant Vice Chancellor of General Services, Jack Powazek and Jack Tchilingirian, UCLA General Services, Computing Resource Manager, and to my friends and family, for their belief in my ability to succeed and accomplish a goal that at one time, appeared impossible.

I would also like to thank Professors Arleen Leibowitz and Meredith Phillips for their help and advice throughout the course of this project, my peer reviewers in Professor Kleiman's Advisor group, the members of the Disaster Resistant Universities List Serve (DRU), and the Emergency Services and Communications Personnel at all of the UC schools.

I also give immense appreciation to the people at Myspace.com and Fox Interactive, without whom, this project could not have begun; Hemanshu Nigam, for listening and taking a chance on a simple but controversial concept, Janel Artis, Micah Miller, and Chris White for their support and guidance. To Alia Seraj, Laura Glascott, Jennifer Darae, Casey Phillips, Scott Simoneaux and Michael Patterson, I could not have done this without you.

Finally, this project is dedicated to the students at Virginia Tech and Northern Illinois Universities, and for all those who found themselves lost in the Storm. This is for you.

I. EXECUTIVE SUMMARY

A trend in manmade and natural emergencies has forced universities to reevaluate their emergency communications practices. Despite efforts to integrate modern technologies such as mail and text messaging systems, schools continue to struggle in communicating with students, faculty and staff: unfamiliar opt-in methods leave disinterested students out of the loop, messages are not disseminated in a timely or efficient manner, misinformation and rumors continue, and systems can fail when they are most needed.¹ Furthermore, campus emergencies, like the shootings at Virginia Tech and Northern Illinois University, have revealed an overwhelming need for university emergency communications to include not only the students, but the surrounding neighborhoods, parents, friends and loved ones, and the media.

To address these issues, universities have three options: to continue current practices, to purchase new systems, or to adopt and implement already-established methods, like social networking. While current communications practices have been proven insufficient and commercial software can be expensive, social networking is cheap, quick, independently robust, and offers a format to communicate with potentially thousands of individuals in a matter of minutes. Additionally, social networking methods are already familiar and remarkably popular among the college demographic; students visit these sites in class, at home, and at work, sometimes multiple times a day.

Should a school decide to integrate social networking, it then has a variety of design elements from which to choose, in accordance with preference, to achieve maximum results. A university must first decide to which department the responsibility of issuing the initial warning and maintaining the profile throughout an emergency will fall; will it reside within the office of emergency management, or the department of communications? Other choices include comment policy and the level of acceptable community to university interaction: between one-to-many, many-to-one, and many-to-many; these options refer to the method of communication between a user and the school, the school and the community, and among the community themselves, and finally, and how to integrate these new methods with those current. Inevitably, there will be tradeoffs among different desirable characteristics of a system including: coverage, speed, reliability, cost, privacy and control. Having made these choices, a school must then implement them technically, operationally, and organizationally.

This project is not intended to serve as a definitive solution to the communications issues experienced by university and emergency personnel; several methods may be necessary to achieve maximized results. As a crisis can happen at any time, however, it is important that universities take action as soon as possible. The integration of social networking is quick and simple, with minimal cost incurred by all those involved.

¹ Cohen, Jody S. and Torriero, E.A., "Up-To-The-Minute Messaging System Put To The Test," *Chicago Tribune Online* (15 February 2008), www.chicagotribune.com/news/local/chi-niu-security_15feb15.0.6664175_story.

II. CURRENT EVENTS

Virginia Tech University

On April 16th of 2007, an unidentified gunman shot and killed two students in university housing at Virginia Tech. Hours later, the same gunman opened fire in another building, killing thirty-one more students and injuring several others.² In the interval between the two shootings, the university made no attempt to evacuate or to notify its students of the impending danger.³ After learning of the event, students and others in the community inundated the Internet in search of information. In the surge of activity, the school website crashed.⁴ New information sources, ranging from cell phone videos taken by students at the scene, to chat rooms, text messages and personal and commercial blogs all provided information that the school could not authenticate.⁵

The story was posted to Fark.com, an Internet blog, on the morning of April 16th. By that afternoon, the site had several comments from a wide variety of sources, including students under attack, students receiving phone calls and texts from those caught inside, media looking for individuals with information, families looking for loved ones and friends and individuals

² Hauser, Christine and O'Connor, Anahad, "Virginia Tech Shooting Leaves 33 Dead," *New York Times Online* (16 April 2007), <http://www.nytimes.com/2007/04/16/us/16cnd-shooting.html>.

³ Ibid.

⁴ Cleary, Tom, "VirginiaTech Shooting Advances Discussions of Fairfield Security," *Fairfield Mirror Online* (26 April 2007), <http://media.www.fairfieldmirror.com/media/storage/paper148/news/2007/04/26/News/Virginia.Tech.Shooting.Advances.Discussion.Of.Fairfield.Security-2879678.shtml>.

⁵ "Technology Helped Virginia Tech Students Connect After Tragedy," *Online News Hour Transcript*, PBS, Aired 18 April 2007. http://www.pbs.org/newshour/bb/science/jan-june07/vatech_04-18.html.

listening to police scanners.⁶ In total, the discussion thread reached over 1000 comments, and stretched over 150 pages in length. It was the wide variety of sources on this blog, however, that made it difficult to distinguish fact from fiction. Several sources conflicted on many points: the death toll, for example, ranged from 2 to 80, over the first several hours.⁷ Many sources debated the identity of those killed; others argued over the identity of the shooter.⁸ In the hours following the event, confusion ensued in the absence of official information.

Northern Illinois University

Fortunately, the lessons of the Virginia Tech tragedy led to an Illinois state review panel critique of university administrators' disaster response methods. The panel pushed Northern Illinois University to implement a robust communications system complete with several methods of messaging, prior to the campus's February 14th 2008 shooting, when a gunman opened fire in a classroom at the school, killing five students, wounding sixteen others, and finally taking his own life.⁹

Although "the incident lasted no longer than a few seconds," according to the university's police chief, Donald Grady, NIU quickly posted a "CAMPUS ALERT" message on the school website, and, within 20 minutes, had sent e-mail alerts to all campus email accounts, instructing

⁶ Fark.com [Blog on Internet] "Shooting Confirmed at Virginia Tech," Fark.com Blog, comments posted on 16 April 2007, <http://forums.fark.com/cgi/fark/comments.pl?IDLlink=2742309>.

⁷ Ibid.

⁸ Ibid.

⁹ Slevin, Peter and Lydersen, Kari, "Gunman at Illinois College Kills 5 Students, Wounds 16," *Washington Post Online* (15 February 2008), <http://www.washingtonpost.com/wp-dyn/content/article/2008/02/14/AR2008021402647.html?sid=ST2008021402970>.

members of the university community to “get to a safe area and take precautions.”¹⁰ The same message was also automatically relayed to all office and dormitory phones.¹¹

The lessons learned from the Virginia Tech incident and others, coupled with the successes of NIU’s immediate and efficient response, may now serve as a model for university crisis communications; however, schools must recognize that technology continues to advance, and that communications methods and trends will change in ability and popularity as interests fluctuate over time. To best serve the campus and community during an emergency, a school must constantly reassess not only the capabilities of their methods, but also the appropriateness of those methods in relation with current communications trends.

III. LESSONS LEARNED

By evaluating the tragic events of the past and highlighting areas of success and failure, Emergency Services Officials and Communications Departments can better respond to future threats of school violence.

*Advanced planning is necessary to disseminate information as quickly as possible at the onset of a crisis.*¹² Immediately following a disaster, several channels of communication must be immediately available to manage the surge of activity as individuals, businesses and emergency officials inundate all available channels. Currently, universities utilize several

¹⁰ Slevin, Peter and Lydersen, Kari, “Gunman at Illinois College Kills 5 Students, Wounds 16,” *Washington Post Online* (15 February 2008) <http://www.washingtonpost.com/wp-dyn/content/article/2008/02/14/AR2008021402647.html?sid=ST2008021402970>.

¹¹ Ibid.

¹² Mckay, Jim, “Early Warning,” *Govtech.com* (21 Nov 200), <http://www.govtech.com/em/206151>.

methods for communicating with students and media following an event, including text messaging services, emails, sirens, television and radio messages, and posting information on the school's website.¹³ These systems must be in place prior to an event, tested, reinforced and updated on a regular basis.

School-based websites and cellular phone infrastructure can become overloaded due to heightened activity and may crash¹⁴. Immediately following an emergency, cellular phone service infrastructure, websites, Call centers and message boards can collapse.¹⁵ Not only can these systems fail in an activity surge, but also due to problems produced by the emergency itself.

Information and rumor control is essential in maintaining a safe and successful response. In the absence of official lines of communication, students and individuals have no choice but to turn to whatever means of communication and technology that is available to them, without regard for the validity of the source.¹⁶ Immediately following a disaster, the presence of new and unauthorized websites and chat rooms that disseminate rumors and misinformation can

¹³ Burton, Fred, "The Virginia Tech Shootings: A Case For Redundant Systems," *Stratfor.com* (17 April 2007), http://www.stratfor.com/virginia_tech_shootings_case_redundant_communications.

¹⁴ Carvin, Andy. "Yet Another Wakeup Call For Better Emergency Preparedness," *PBS*, (18 April 2007), http://www.pbs.org/teachers/learning.now/2007/04/virginia_tech_yet_another_wake.html.

¹⁵ Joly, Karine, "After Two Dorms Were Destroyed By A Tornado and Its Website Went Down, Union University Relies On Blogs and Its Facebook Page For Its Online Emergency Communications," *College Web Editor*, (6 February 2008), www.collegewebeditor.com/blog/index.php/archives/2008/02/06/after-2-dorms-were-destroyed-by-a-tornado-and-its-website-went-down-union-university-relies-a-blog-and-its-facebook-page-for-its-online-emergency-communications.

¹⁶ Burns, Dave, CEM, Director of Emergency Management, UCLA, Personal Interview, October 2008.

greatly threaten the public's ability to decipher fact from fiction in important areas such as life safety, instructions for evacuation, family outreach, shelter, reunification, food and clothing, etc.

Redundant systems are essential for business continuity.¹⁷ Great efforts must be made to implement redundant technologies in emergency communications to ensure that verified information is made constantly available, at the onset and throughout the course of an emergency.

Commercial software is costly. With the advent of recent technologies in the fields of cyber communications, commercial software is now available from a variety of sources. While purchasing these systems requires a significant investment, social networking sites, on the other hand, provide similar, if not identical, services for free.

Current university emergency communications methods have not yet attained sufficient participation among the college demographic. The University of Chicago currently reports that only 7,700 of the 28,000 students have signed up for the campus messaging system.¹⁸ UCLA assigns an UCLA.edu email address to nearly 100% of its incoming students; however, less than half use the university-assigned address as their primary source of email communications.¹⁹ Additionally, only 32% (approximately 13,000 students) currently subscribe to the campus's emergency messaging system.²⁰ Furthermore, campus emergencies often affect the surrounding

¹⁷ Burton, Fred, "The Virginia Tech Shootings: A Case For Redundant Systems," *Stratfor.com* (17 April 2007), http://www.stratfor.com/virginia_tech_shootings_case_redundant_communications.

¹⁸ Cohen, Jody S. and Torriero, E.A., "Up-To-The-Minute Messaging System Put To The Test," *Chicago Tribune* (15 February 2008), www.chicagotribune.com/news/local/chi-niu-security_15feb15.0.6664175.story.

¹⁹ Burns, David, CEM, Director of Emergency Management, UCLA, Personal Interview, 30 October 2007.

²⁰ Ibid.

neighborhoods, parents, friends, etc.; university communications methods, however, have not yet been extended to include these interested parties.

Alternative methods, like social networking, can help university administrators and emergency managers correct emergency communications issues. Social networking is popular, well-established among the college demographic, can reach both the community and general public with little effort, is cheap, quick, and supported by servers and systems not supported by the university's own infrastructure. By integrating social networking into university emergency communications, schools will be able with disseminate messages in a timely manner, maintain lines of communication throughout an event, notify all interested parties, including students, faculty, staff, parents, friends, loved ones and the media, and adapt as technologies and trends change over time.

IV. Social Networking

A Rise in Popularity

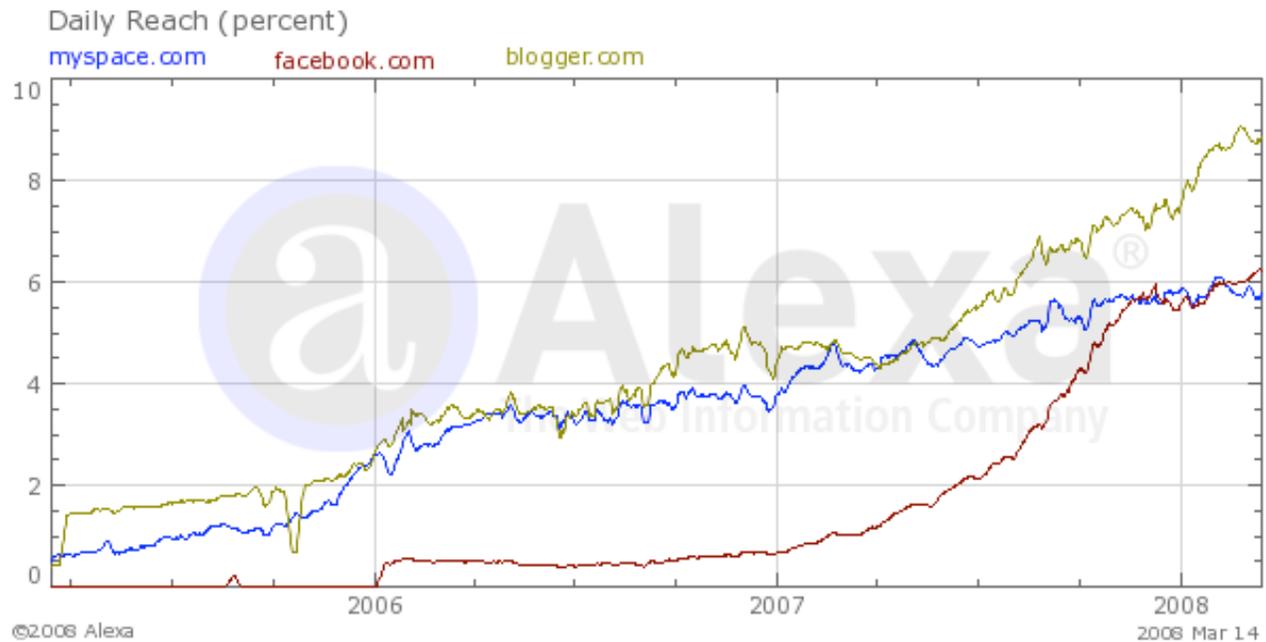
College Internet use has increased immensely over the past two decades. A Pew Internet and American Life Project found that 86% of its sample, collected from ten Chicago-area colleges, goes online on a regular basis.²¹ Once online, these users consistently visit social networking sites, which have risen in popularity since the 1990's. Currently, dozens of social networking sites can be found on the Internet (approximately 119), with more introduced each year.²² In fact, a 2006 Nielsen NetRatings study reported that the top 10 social networking sites

²¹ Jones, Steve et al., *The Internet Goes To College*, Pew Internet and American Life Project, Tides Center, September 2002

²² Wikipedia.org (26 April 2008) www.wikipedia.org.

had seen a 47% increase in traffic flow in the past year, with Myspace.com (367%) and MSN Spaces (286%) experiencing the most growth overall.²³

Specifically, popular sites like Myspace.com, Facebook.com and Blogger.com have experienced significant growth in the percentage of global reach, based on daily activity.²⁴

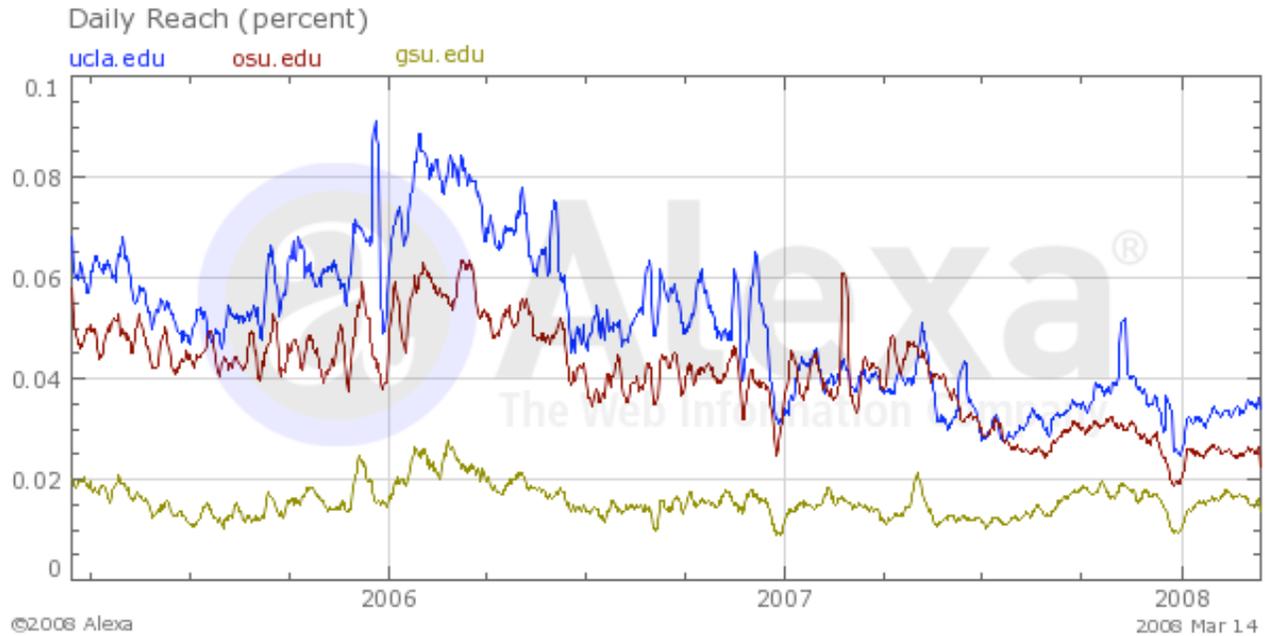


School websites, on the other hand, like those of UCLA, UGA and OSU, have experienced a steady decline in the percentage of global reach, based on daily activity, since 2006.²⁵

²³ Kirkpatrick, Marshall, "Top 10 Social Networking Sites See 47% Growth," *The Social Software Web Blog*, (17 May 2006), <http://socialsoftware.weblogsinc.com/2006/05/17/top-10-social-networking-sites-see-47-growth/>.

²⁴ Alexa.com (14 March 2008), <http://www.Alexa.com>.

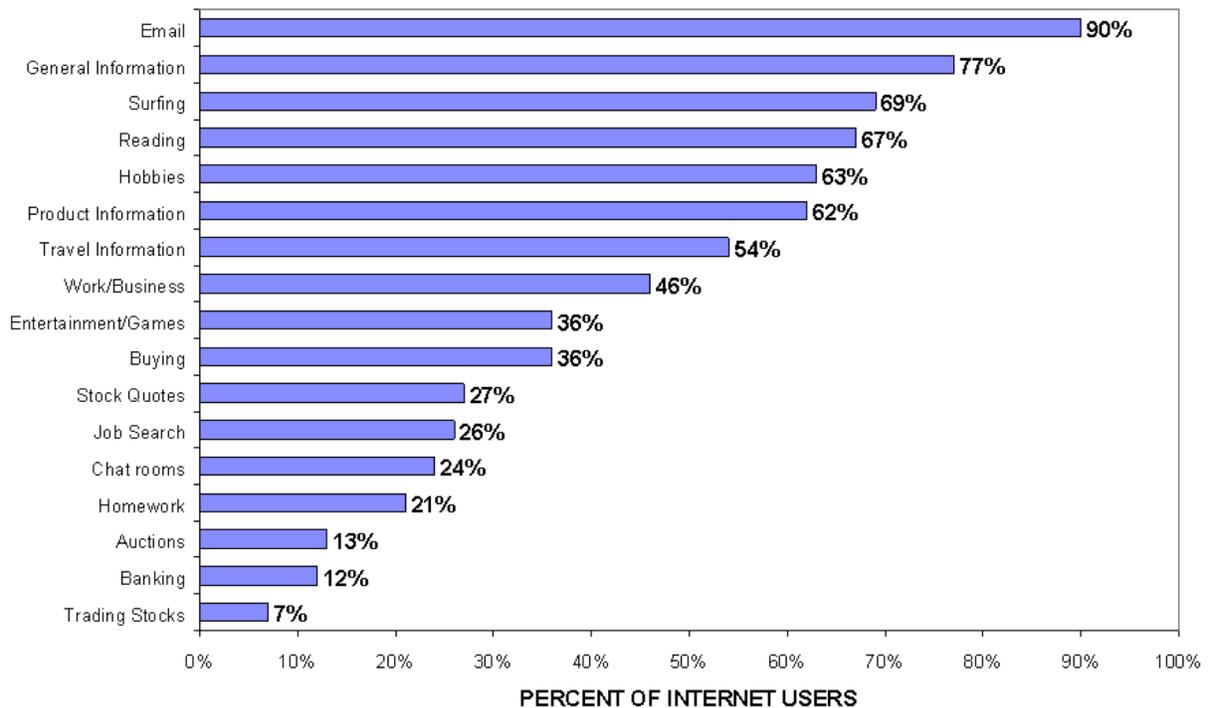
²⁵ Ibid.



The two graphs, when compared concurrently, depict a contrasting trend in Internet usage among the same demographic. The popularity of social networking, as shown by these graphs, suggests that the college demographic is potentially more accessible via social networking channels than through standard university communications methods like the university website.

While online, these students participate in a variety of activities, from emailing and general surfing to conducting business, trade and entertainment. The following graph depicts Internet usage as found by a report conducted by the Stanford Institute For the Quantitative Study of Society, titled, Internet and Society: A Preliminary Report.

WHAT USERS DO ON THE INTERNET

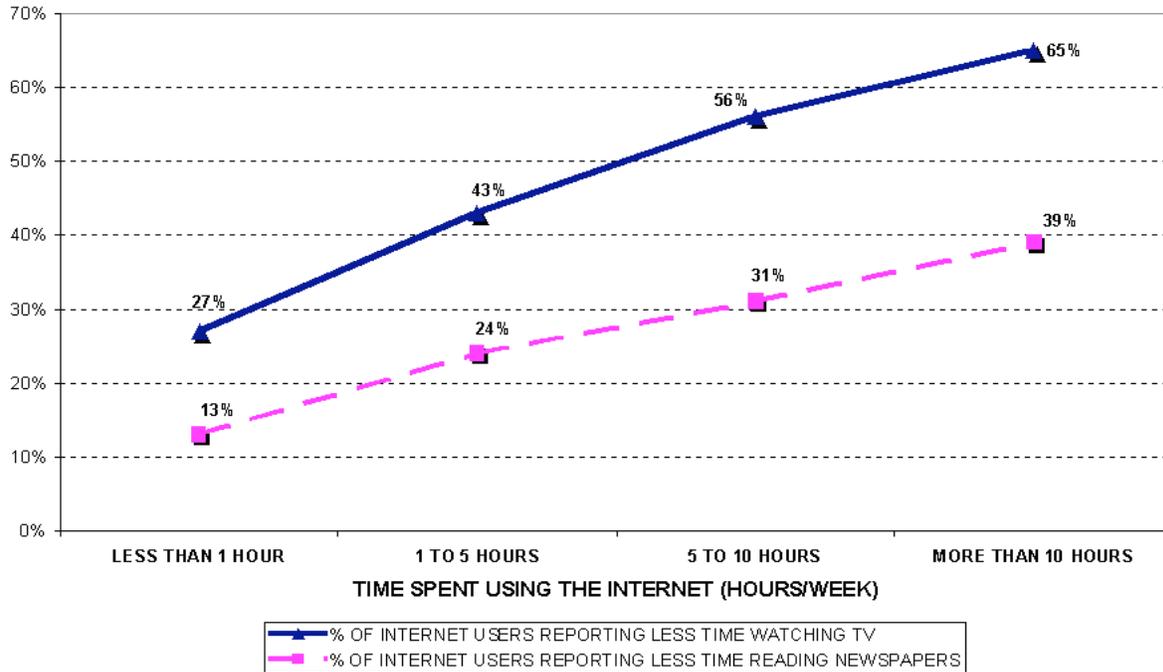


Nie, Norman and Erbring, Lutz, *Internet and Society*, SIQSS (17 February 2000) Chart 9.

Furthermore, the report found that the time a user spends surfing the Internet directly affects his or her time consuming other mass media, like television and newspaper, in a negative manner. The following graph suggests that the percentage of users deserting mass media nearly triples as Internet use moves from 1 hour to more than 10 hours per week.²⁶

²⁶ Nie, Norman and Erbring, Lutz, *Internet and Society*, SIQSS (17 February 2000).

INTERNET USERS DESERT THE MASS MEDIA



Nie, Norman and Erbring, Lutz, *Internet and Society*, SIQSS (17 February 2000) Chart 11.

How Social Networking Works

Social Networking sites, like Myspace.com and Facebook.com, offer a simple platform for individuals to communicate with a large community. These sites provide automated services for members to connect with other members through a variety of methods; many sites are also accessible to the general public. To register for a site, a user must enter demographic information including zip code, age, interests, etc. and choose a username and password. Once registered, a member can log into his or her “profile” (personal homepage), to connect with the site’s member network. Most sites offer profile templates that can be easily manipulated, so that a user can design the page according to his or her preferences in color, text, settings, etc.

Once signed in, a user can browse through the site's network of registered members, and request that others become his or her profile Friend. These Friend connections serve as a direct link between two profiles, enabling each individual to communicate directly through the site's various automated services.

The site's network consists of a "web" of individual users, connected by varying degrees of association. The interconnectivity of this web enables a user to reach thousands with one post, through a process known as viral communications.²⁷ Once a user has posted a message, it is automatically transmitted to all of his or her profile Friends, who can then simply send the message from their own profile in the same manner. The message will then, again, be automatically transmitted to all of those profile Friends, and so on. Much like the way a virus reproduces exponentially, viral communications methods enable one person to reach thousands in a very short period of time.

A user can communicate with others in the site's network in three ways: by emailing individual users directly, posting bulletins that are automatically received by profile Friends, or by publishing blog entries on the profile homepage. Many sites offer subscription service for these blogs; Friends who subscribe will receive notification of an updated or new entry. A user can also set preferences regarding privacy, comment policy and message notification options, according to his or her liking.

²⁷ "Viral Marketing," *Wikipedia.org*, (5 March 2008), http://en.wikipedia.org/wiki/Viral_marketing.

Operational Dimensions

Certain operational dimensions characteristic of most social networking sites will help to resolve concerns involving security, system robustness, information, messaging and notification maintenance, and reliability issues.

Username/Password

The creator of a profile retains complete ownership over the information, publication, and changes to the individual site. A profile can only be accessed when both the username and password are entered. The user may change the password at any time; however, in order to verify the change, the site will send an email to the user via an alternative email account. To complete the process, the user must then log back into the site to enter both the old and new password.

Access

Social networking sites provide a platform for the online publication of a profile that can be made accessible to both the public, and/or limited to a pre-established network of Friends.

Public view: Choosing the public view setting will allow anyone with a computer to view the profile through its URL address at any time.

(Example URL: www.myspace.com/UCLA911)

Private view: Social Networking sites allow users to set their profiles to “private”, which will allow only those individuals previously accepted by the authorized user to view the site. Profile Friends may view information

posted to the page at any time. A university may choose to keep the profile private until an emergency warrants a change in status; a change from private to public status may heighten the public's awareness of an impending disaster.

Finding other users

Most sites provide search engines for users to find friends, colleagues and other users. Typically, a user can either conduct a general search, by entering demographic information to narrow down to a specific group of users, or a specific search, which requires the full name or email address of the individual being sought. In the interest of safety, many sites may utilize security precautions for minors. For example, Myspace.com does not allow the profiles of users under the age of 18 to appear in general search inquiries.

System Failure

All systems can experience failure at any time, for a variety of reasons. It is for this reason that universities must include several levels of redundancy in their communications system. The practice of using mirrored servers and RSS code, (See Information Maintenance), will help to mitigate the effects of system failure.

Bandwidth and System Reliability

A website's bandwidth, or the amount of data that can be transferred over an Internet connection in a given time, is based on the estimate of its user base.²⁸ UCLA.edu typically expects anywhere from 500,000 to 1 million users, and acquires bandwidth accordingly.²⁹ A social networking site, like Myspace.com, on the other hand, supports a user base of approximately 250 million individuals on a given day.³⁰ The same bandwidth required to support such a large user base would inevitably prevent the site from crashing in a surge of activity associated with the incident.

In an emergency, website traffic, or the number of users visiting a site, may increase significantly; when traffic greatly exceeds the expected range in a short period of time, the site may crash.³¹ The same concept applies when there is a surge in cell phone use: frequencies become congested when an abnormally large group of users attempt to make calls originating in the same local area; as the number of calls increases, so to, does the difficulty to complete a call.

Furthermore, the mere existence of social networking sites may improve the reliability of other university communications methods; alternative sites may draw

²⁸ "Definition: Bandwidth," *Createawebsite.com* (12 March 2008), <http://www.createafreewebsite.net/bandwidth.html>.

²⁹ Burns, David, CEM, Director of Emergency Management, UCLA, Personal Interview. 30 October 2007.

³⁰ Myspace.com (6 March 2008), www.myspace.com

³¹ Carvin, Andy. "Yet Another Wakeup Call For Better Emergency Preparedness," *PBS*, (18 April 2007), http://www.pbs.org/teachers/learning.now/2007/04/virginia_tech_yet_another_wake.html

website traffic away from a school website during an emergency, thus decreasing the chances of website failure in an activity surge.

Information Maintenance

Services like RSS news feeds and third-party software allow students to receive information updates without logging in to the original website. RSS can even be received by handheld devices, like smart phones and Apple's *iPhone*. The growing popularity, availability and decreasing prices of these technologies may help to increase site accessibility as time progresses.

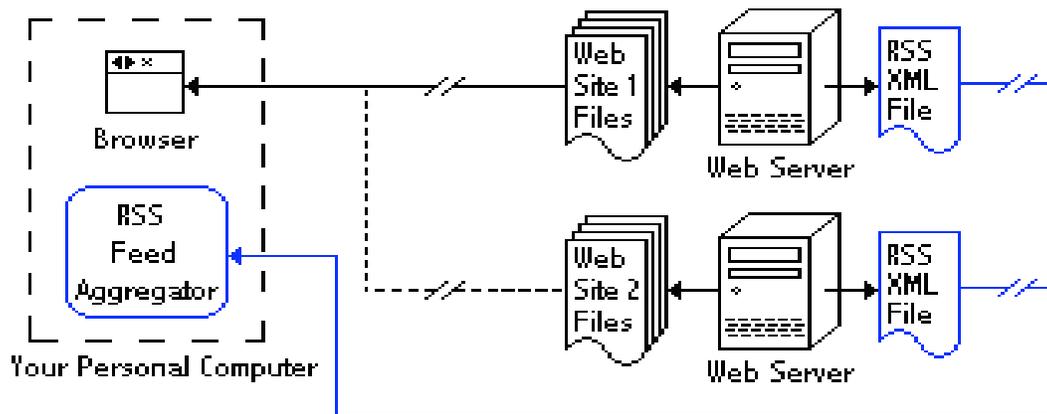
What is RSS?³²

Several sites now broadcast information using RSS newsfeeds: RSS, which stands for “really simple syndication”, requires subscription by a user, who, in essence, “links” his or her computer or hand-held to a publishing site. As the publishing site broadcasts its RSS feed, the same information is simultaneously received by all subscribing devices. Users no longer have to log into a site, like CNN.com, to get the news. Instead, by subscribing to the site's RSS feed, a user can receive information posted to the site, without viewing the page itself. This feed is updated automatically and constantly pulled by the subscribing device, so that the

³² Tchilingirian, Jack, UCLA General Services, Computing Resource Manager, Phone Interview, 6 March 2008.

user can be aware of all new information posted on the original site. Many websites now offer RSS subscription.

The following is a diagram of how RSS pulls from a web server broadcasting the RSS, in XML, and converts the information to a format readable by a browser located in a personal computer or handheld device.



What is RSS?, Softwaregarden.com Inc, (28 April 2008).

Redundancy

It is standard practice for universities to have redundant server systems as part of their business continuity plan. These servers can be located in different geographic regions, as back-ups for their own websites and online services. These back-up servers “mirror” the original site in content and data, and can be brought online quickly to restore university online services if and when the original site crashes.³³ Once a mirrored server

³³ Burns, David, CEM, Director of Emergency Management, UCLA, Personal Interview. 30 October 2007.

is brought online, it will replace the original website, and immediately begin broadcasting its content.

RSS code pulls data directly from a broadcasting site, transmitting it to the subscribing device. Should the original broadcasting site crash, the RSS feed can no longer pull information from that site. However, RSS code can be written to include several other sources, and pull from the first one available, should any go down. This action, known as “round-robinning RSS,”³⁴ creates continuity for subscribing RSS devices. The subscribing site or device pulls from the original server until it is no longer available, at which time it will search for another, and continue until it finds one that works; the length of time a subscribing site takes to find the next available server depends specifically on the type of RSS coding used.³⁵

Messaging Options

A social networking site offers a few options for messaging, which are available to the authorized user at all times. Certain messaging options involve notification methods, which are automatically received by profile Friends; others are published on the profile’s homepage and viewable by the general public, if the page is set to public view.

Email: Social networking emailing works much like a regular email account.

Emails can be sent from a user to the inbox of another user at any time. A “new

³⁴ Tchilingirian, Jack, UCLA General Services, Computing Resource Manager, Phone Interview, 6 March 2008.

³⁵ *RSS code will soon be available on the UCLA Myspace profile; located at www.myspace.com/ucla911. This code can be copied and pasted to a school’s profile, and edited to include university-specific server and directory information.*

messages” icon will appear on the user’s homepage, notifying them of the existence of a new and unread message. Email messages are only viewable by the user when logged in; messages are located in the user’s mailbox.

Bulletins: A bulletin is a message that a user may write that is posted to the “bulletin section” of the profile. A bulletin is sent to all profile Friends, and published within their own bulletin section, in chronological order. Bulletins are archived so that a user may search backwards to view bulletins posted while offline.

Blogs: A blog is an online diary. A user can write a blog entry, which will be published on a separate page, connected to his or her profile homepage. The title of the post is chosen by the user and published on the homepage itself as an icon, which, if clicked, will lead the viewer directly to the post. If a profile is publically accessible, blog comments can be seen by users at any time. Users can also “subscribe” to a blog; whenever a new blog entry is made, subscribers will receive notification; the manner of receipt depends on user preferences and site capabilities.

Notification Methods

Many sites currently offer two methods of notification: via email and text. Third-Party software, installed by a user, may be used to receive RSS outside of the social networking site’s platform.

Email: Profile Friends automatically receive an email via an alternate account notifying them of an unread email in their profile's inbox. The email identifies the sender, and offers a direct link to the site. The user must log into the site, however, to view the message.

Text Message: Many sites offer automatic text messages notifying users of unread messages. Individual users must choose this option and enter a destination cellular phone number or alternate email account. The user can also choose when to receive notification: when an email is received and when a comment is posted on their profile. Again, this user must log into the site to view the actual message or comment.

RSS: Certain instant messaging services are capable of receiving RSS in the form of an Instant Message that is received when a user is signed in to the service. Most Instant Messaging services are now available on both computers and handheld devices. Users can also copy the RSS feeder from a site and embed it within their own profile, so that information posted to the broadcasting site will be published on the subscriber's site simultaneously.

Hand-held Devices: Many social networking sites are now available on hand-held devices with Internet capabilities. Facebook.com has created a completely operational version of their site for handhelds, so that users can log in, send and receive messages, post and view other profiles as if they were in front of a computer. Other sites, like Myspace.com, are viewable on handhelds with Internet service as well; however, users may experience problems when viewing these

sites, as the site options available to them depend specifically on the service capabilities of their cellular carrier, and device ability. Many websites now offer a special version of their site to be viewed via hand-held devices.

Security

As the popularity of social networking grows, so too do concerns regarding the safety and security of the site's users. Recent studies have shown, however, that child abductions and violence resulting from connections made on social networking sites such as Myspace.com and Facebook.com are, in fact, rare.³⁶ As a result of these fears, however, many security measures are now available on these sites, including parental control, firewalls and website blocking. Some social networking providers even patrol their sites for potential predators and suspicious activity³⁷.

Cases of identity theft have increased in recent years as well.³⁸ Recently, sites like Myspace.com have experienced an occurrence known as phishing - an act that "usually starts with emails that appear to come from a trusted entity, directing users to another, identical site, then asking users to confirm or renew private account information. Once

³⁶ Albanesius, Chloe, "Study: Sex Offenders Use Chat Rooms, Not Facebook," *PCMag.com*, (20 February 2008), <http://www.pcmag.com/article2/0,1759,2265571,00.asp?kc=PCRSS03069TX1K0001121>.

³⁷ Scott, Katie, "Myspace Puts Child Protection Measures In Place," *Pocket-Lint.Co.Uk*, (15 January 2008), <http://www.pocket-lint.co.uk/news/news.phtml/12263/13287/MySpace-unveils-child-protection-measures.phtml>.

³⁸ "Social Networking Sites, A Haven for Identity Thieves," *TrustedID.com* (5 March 2008), https://www.trustedid.com/html/identity_theft_protection_resource_013.php.

personal account information has been entered, the hacker can use it to send messages from the user's accounts, transfer funds and/or make purchases.”³⁹

Site administrators are well aware of this problem and suggest that users change the account password from time to time, remain cautious of all advertisements, commercial emails, unknown users and emails that redirect to another site. Certain sites, like Myspace.com, warn users with pop-up messages when a user attempts to leave the site for another through an advertisement or post. Universities can disable HTML on the profile to protect users from these practices; disabling HTML will remove images and hyperlinks, so that users are not able to connect to another site simply by clicking on an image.

Comments

To post a comment, a user must first be a confirmed profile Friend. Non-members and unauthorized users cannot post comments. Users can choose between three options of comment policy. A user can choose to allow all comments to post automatically, to require authorization before publication, or to disable the comments section all together. If a user chooses to require authorization, an email will be sent to the user in the same manner as a standard message, notifying them of the pending comment request. At this time, the user may then accept or reject the comment. Once accepted, the comment is automatically published to the profile page.

³⁹ “New Leahy Bill Targets Internet “Phishing” and “Pharming” That Steal Billions of Dollars Annually From Consumers,” Senate Statement Transcript, www.leahy.senate.gov (28 February 2008), <http://leahy.senate.gov/press/200503/030105.html>.

Friends

A profile includes a Friends section, in which the pictures associated with the profile's Friends are viewable. These pictures also serve as a direct connection to the Friend's profile, and require only one click to move from one profile to the next. Users may choose, however, to disable the Friends section, so that the identity of the profile Friends remains hidden.

A user can request that another become his or her Friend; however, a connection is not established until the latter user accepts the request. A user can also invite those who are not yet members of the site, by entering the email addresses of those they wish to invite. The site will then automatically send an email to those individuals, offering them the option of both signing up for the site as well as joining the requesting party's Friend network.

Potential Issues

Despite social networking's many advantages, there are a few issues that may arise in its integration in university emergency communications. However, upon closer inspection, these issues become minimal at best, and in many cases, can be easily addressed.

Is computer ownership a problem?

University administrators have raised concerns that the percentage of computer use, ownership and overall availability may affect a school's ability to reach students via

technology that requires access to a computer.⁴⁰ A 2007 study, conducted by the Educause Center for Applied Research, however, found that 98.4% of all respondents owned some type of computer, and that the type of computer owned by nearly three quarters of those respondents (73.7%) was a laptop. In fact, the study concludes that laptop ownership had increased from 52.8% in 2005 to 75.8% in 2007.⁴¹ Furthermore, the study also found that 64% of all first year freshmen at four-year, accredited universities owned a laptop less than one year old.⁴²

Not only does the majority of the college demographic own a computer, but also uses it as their main communications method as well.⁴³ 99.9% of the study's respondents reportedly read, wrote, and sent emails, spending an average of 18 hours a week on the computer, for work, school and recreational purposes.⁴⁴

How To Reach the Disconnected User

Despite the study's findings, universities may continue to have concerns in their ability to reach 100% of the student population should they include Internet services in their emergency communications methods. Schools must realize that there is no one way to reach 100% of the impacted population, however, because of individual preferences,

⁴⁰ Powazek, Jack, Vice Chancellor of General Services, UCLA, Personal Interview, 6 March 2008.

⁴¹ Salaway, Gail, Caruso, Judith Borreson, Nelson, Mark R., and Dede, Chris, "The ECAR Study of Undergraduate Students and Information Technology, 2007," *Educause Center for Applied Research Volume 6 (2007)* pg 10, <http://www.educause.edu/ir/library/pdf/ers0706/rs/ERS0706w.pdf>.

⁴² Ibid.

⁴³ Ibid.

⁴⁴ Ibid pg 11.

abilities and resources. Instead, universities must note that a vast percentage of the population can be reached when several options are utilized at once.

Furthermore, the requirement of ownership and accessibility to a computer may be quickly losing importance in the ability to maintain an Internet connection. The Educause study also found that one in twelve students now own a smart phone with Internet capabilities, increasing from 7.8% in 2005 to 10.1% in 2007.⁴⁵

V. IMPLEMENTATION AND DESIGN CHOICES

Social networking sites provide universities with a means to communicate directly with students through popular, well-established networks. As these sites offer a variety of settings and services conducive to the goals and objectives of emergency communications, a university can choose among these options to best fit the needs and policies of the school. Before making a final decision, however, universities must first address their needs, present technical capabilities of the school while considering the technical savvy of its students, and the consequences of these decisions as they relate to the university's political structure, the timeframe available for implementation, and the safety and well-being of the student population, faculty and parents.

Once the decision to include social networking has been made, a university then has a variety of choices to make regarding site design and operation. The discussion below is a necessary prologue laying out these choices and steps.

⁴⁵ Salaway, Gail, Caruso, Judith Borreson, Nelson, Mark R., and Dede, Chris, "The ECAR Study of Undergraduate Students and Information Technology, 2007," *Educause Center for Applied Research Volume 6 (2007)* pg 10, <http://www.educause.edu/ir/library/pdf/ers0706/rs/ERS0706w.pdf>.

Choosing the Site

There are several social networking sites from which to choose, some more popular than others. The two most popular social networking sites among the student demographic right now are Myspace.com and Facebook.com.⁴⁶ However, Facebook.com and Myspace.com differ greatly in one specific detail: in order to view a profile hosted by the Facebook.com server, one must be a member of the site (requiring a few minutes of registration prior to signing in). Myspace.com profiles, on the other hand, if set for public view, can be read by the general public at any time.

During an emergency, a publicly accessible profile may prove most efficient in disseminating important information; membership requirements can potentially deter individuals from visiting the site. There is no reason, however, why a university should choose not to use many social networking sites; incorporating several sites would greatly expand the scope of the university's emergency communications system.

Furthermore, with the inclusion of RSS technology, a university can easily employ several sites at once; RSS code, copied and pasted to each site, simultaneously broadcasts identical information to all recipients, without additional cost or time required. The university must only employ staff to build and design the site, adding the code. Once created, all sites can be easily manipulated without much additional work.

⁴⁶ Gouveia, Pedro de, "The Four Most Popular Social Networking Sites," *Bizcommunity.com* (12 March 2008) <http://www.bizcommunity.com/Article/196/16/20623.html>.

Profile Management and Responsibilities

Should a university decide to integrate social networking into its emergency communications practices, it must then decide how to assign the responsibilities of site activation, message dissemination, and information maintenance. Additionally, a school must decide in which department these responsibilities will reside. Communications Departments have historically been the central point in a university's information infrastructure, administrating the school's websites, issuing press releases, handling press inquiries and controlling the dissemination of all messages to students, faculty and staff.⁴⁷ At the onset of an emergency, however, an Emergency Services Official must also have the ability to transmit messages and relay information to the affected population. Furthermore, emergencies can occur at any time; the staffing required for message dissemination may not be available after-hours: emergency services officials like an emergency manager and/or public safety officer may be the only person present to initiate a messaging system. An argument can be made, then, for these responsibilities to fall between both departments.

At the onset of an emergency, an immediate warning is required to inform the population of an impending threat and continue until that threat has subsided. An emergency services official can often be the first to receive details of an emergency. The ability to send an immediate message at the onset of a crisis must therefore include members of the department of emergency services.⁴⁸ Once an emergency has occurred, however, the emergency services official will most likely participate in an active response. The communications department and/or public

⁴⁷ Burns, David, CEM, Director of Emergency Management, UCLA, Personal Interview, 30 October 2007.

⁴⁸ Ibid.

information official should then maintain the responsibility of ongoing communications and dissemination of important information throughout the duration of the crisis.⁴⁹

Emergency personnel should have the authority to generate key messages at the onset of a disaster, sending them through the various communications channels available to the university. Communications departments and/or public information officials, additionally, must plan and prepare to continue information dissemination and maintenance, throughout the duration of the event.⁵⁰ By combining the resources and expertise of both departments, universities can notify their population of a crisis in a timely manner, provide updates as needed, all while ensuring the validity of all available information.

Set up and Profile Maintenance

Although a social networking site requires the cooperation and collaboration of both university emergency and communications personnel during a crisis, a single person and/or department can handle most of the site's set-up and maintenance.

The time required to set up a profile is directly correlated to the user's preferences. A simple profile can be completed within a few minutes while a more detailed profile may take longer. The length of time spent on the set-up is also directly correlated with the user's technical knowledge of html code and website design. Most social networking sites provide simple templates, however, so that even the most inexperienced users can set up their profile with a few

⁴⁹ Burns, David, CEM, Director of Emergency Management, UCLA, Personal Interview, 30 October 2007.

⁵⁰ Ibid.

clicks, while still allowing more advanced users have the option of manipulating the page to their own liking.

Once a profile has been created, the only maintenance required for the user is the occasional login to accept Friend requests or make changes to the site's content. Should a user want to extend the profile's Friend network, however, several hours of work may be required, as there is no automated function for making Friend requests. There are a few other methods for populating the site (adding Friends to the network) that will be discussed in further detail in: *Populating the Site*.

Information Flow

The collaborative nature and general infrastructure of the social networking platform allows for three possible design choices for the flow of information. These design choices include one-to-many, in which information originates from the university profile and is accessible to users as "read-only", many-to-one, in which the university profile transmits and receives information from users, and many-to-many, in which the university profile not only sends and receives information from users, but also serves as an open discussion and communication forum for the entire community.

One-to-Many: Information is generated and posted to the profile for public view, and can only be edited or removed by an authorized user. This type of communication does not support online discussion through comments. In this design choice, unauthorized users cannot post information to the page. The authorized department maintains complete control of all viewable information. The profile serves as a point of information during an event, and will serve as the only source of verified information throughout a crisis.

Disadvantages: A one-way communications profile setting does not allow a university to utilize the full extent of the social networking platform's capabilities. Several aspects of the software remain disengaged, including the option for users to generate information and post it on the profile to notify the proper authorities and the community of an unknown event. Furthermore, a university may lose control of published information in a one-to-many setting, as users may choose to visit other, unofficial sites, where open communication is allowed.

Many-to-One: Information is generated and posted for public view on the profile by an authorized user and is accessible in "read-only" format to the community at large. The university can receive messages from users and respond accordingly.

Disadvantages: Users sending emails directly to the university may assume that a message sent is a message received and documented. A social networking site could be used to report incidents in place of other, more conventional means (like calling 911). If a university opens direct communications lines between itself and the community, it assumes the responsibility of reading and dealing with all messages in a timely manner. Should a school want to use this setting, but does not have the means to do so completely, perhaps a disclaimer could be written on the profile, stating that all messages received are for information purposes only, and that senders should have no expectations of immediate response.

Many-to-Many: This format allows open communications between users and the university, and may serve as an online community and discussion forum, monitored by

the university, where users can report important information directly to school authorities, learn of impending threats, and reconnect with loved ones after a disaster.

Disadvantages: This setting can be difficult to monitor, and may require additional staffing; further steps are needed for its maximization. In order to maintain a profile with this setting, a university must choose to either:

- **Allow comments to be posted without approval:** Posted comments would not be authenticated until someone checks the site, or through automated means:
 - Choosing page settings to distinguish between verified and unverified postings. For example, unverified posts could be published in a different color, or without vowels (*disenveling*), until a university official is able to verify the information. Upon verification, a post would automatically change to another text color, or vowels reinstated.
 - Outside Contracting: A university may choose to hire a third-party to monitor site activity constantly; offsite monitoring would require direct communication with the university in order to both maintain the accuracy of all information, and to notify authorities of impending crises in a timely fashion.
- **Require approval before comments are posted:** Significant personnel hours are required to approve all comments to ensure their appropriateness

and validity; this setting could delay the publication of necessary information and may overwhelm university staff. This setting would also require the publication of official school email addresses and contact information, and could even potentially require the collaboration of all public safety departments, including Police and Fire, to combine and prioritize messages received from many sources.

Populating the Site

A university may either choose to require participation or to allow voluntary opt-in membership. Although universities have struggled to achieve sufficient student participation in other opt-in methods such as text messaging and email services, the degree to which the college demographic already uses social networking sites suggests that required use may not be necessary. As of March 14, 2008, Myspace.com reports a total of 32,714 registered current UCLA students, between the ages of 18 and 68, accounting for approximately 89% of the school's 36,611 registered undergraduate and graduate students.^{51 52}

Although these users are registered for Myspace.com, a university must still add them as Friends to its profile, so that they may receive messages and notification automatically. There are several methods available to populate the site:

⁵¹ Myspace.com (6 March 2008), www.myspace.com.

⁵² Burns, David, CEM, Director of Emergency Management, UCLA, Personal Interview. 30 October 2007.

Adding Friends by hand by contacting each user directly.

Universities can send emails informing those individuals within the school database of this service; however, a university will need to collect contact from other interested parties, including faculty and staff, parents and community neighbors, to extend invitations to those outside of its local community, and to encourage enrollment. The social networking site will serve as a database of interested parties that does not require ongoing university maintenance. Users can enroll and remove themselves from the page at any time; only those who wish to receive messages will continue to receive university communications, the Friends network is automatically updated as it changes with time, as individuals graduate, move, etc.

Advertising/marketing/publicizing the site to the media, parents, outside viewers, to increase the knowledge of its existence.

This option may prove quite labor-intensive and costly over time. Hopefully, as universities continue to integrate social networking into their own systems, the popularity of the method will grow.

Requiring all incoming students to sign up with the service at registration, or through other means, depending on available programs.

This option can be difficult to implement, and may not be necessary.

VI. THE FUTURE OF SOCIAL NETWORKING

As new and dynamic Internet tools continue to advance, so too do the capabilities of the social networking platform and communications dissemination channels. Future collaboration, however, will be needed between universities and site administrators to take advantage of the full range of social networking's capabilities.

For example, the project's success could be measured by aggregate website activity, or the number of users viewing the profile, within the disaster's time frame. This information is currently available only to site administrators; however, its release could document the usefulness of social networking, specifically during the crisis.

Social networking's advertising structure may also prove conducive to the needs of emergency managers in the future. Social networking sites collect and store self-reported demographic information provided by users as they register, which is then used in advertising campaigns to target specific demographics. Demographic statistics include age, geographic location, interests, school affiliation, graduation date, income bracket, etc.⁵³ An advertiser can tailor a campaign to a specific demographic, sending one message to specific user group, and a different message to another.⁵⁴

⁵³ Myspace.com (6 March 2008), www.myspace.com.

⁵⁴ Hoffman, Zack, "Benefits to Using Myspace.com To Promote Your Practice," *Articlediscovery.com* (31 January 2008), <http://www.articlediscovery.com/articledetail.php?artid=20699&catid=118&title=Benefits+to+Using+MySpace.com+to+Promote+Your+Practice>.

With the support of social networking sites, emergency managers and communications departments could use demographic targeting to their own benefit. For example, a toxic spill or chemical leak in a specific location would warrant a message sent out specifically to those located in the area of the spill. By targeting only the affected area, universities could save resources and time. Limiting communication to a specific population could also mitigate system overuse. This option, however, is not currently available to universities, and will require future collaboration and greater involvement from social networking sites.

Trends and methods of communication will change over time and as technology advances. So too, will emergency events. Emergency communications methods must be reassessed, tested, and upgraded from time to time, to match the needs and objectives of emergency and communications personnel with the current patterns of communication and capabilities of their community. Social networking provides a platform that is easily built and cheap to implement; its services are adaptable and flexible enough to meet the diversity of universities and their communities. Most importantly, it is another way for schools to communicate with students, parents, friends, loved ones, and the media, with the single click of a button, at a time when they are needed most; during a campus emergency.

VII. SUMMARY OF RECOMMENDATIONS

The addition of social networking will strengthen a university's ability to communicate with its students, the surrounding community, parents, friends, loved ones and the media, during an emergency, when other methods may fail. Given that universities have not yet found any one, or combination of many, communications methods that meet their emergency communications needs in totality, social networking can be a quick and cheap way to strengthen their current communications systems.

Once a school has decided to use social networking, it has several choices and steps to implement them. The following is a summary of recommendations needed for implementation.

- The responsibility to post an initial message should fall to both the emergency services personnel and communications personnel; after-hours policies may be required.
- The responsibility of maintaining the site throughout an event should fall to the communications department.
- Several authorized officials should be given the responsibility to post an initial warning message without approval. This must be addressed early on, so that the site can be activated at the onset of a crisis, without delay.
- A university may want to keep its social networking profile private, and “activate” it only during an emergency.
- The inclusion of RSS will allow a university to post identical and simultaneous information on both the social networking profile and official school website at the same time. Because it is automated, RSS will not require an additional step to update the profile during an emergency.
- RSS will also serve to maintain the validity of information provided throughout an emergency, as it can be set to pull information from backup servers located throughout the country. If the university website crashes, a social networking site can then pull information from the next available server.
- Allowing the profile to serve as a community forum and message board is the best-case scenario but may require increased resources to ensure the validity of the site. A school must either: police the site itself, delegate to a third-party, or install automation to differentiate between validated and pending-validation posts. Instead, a school can use the social networking profile as a one-directional information source, and/or can receive messages from its community through direct email.
- Social networking should remain an opt-in method. Its popularity within the college demographic is sufficient to market the project on its own. A school should, however, make an effort to acquire email contacts of all students' parents, to inform them of the site and to encourage their participation. An invitation to the surrounding neighborhoods and other interested parties should be made as well.

- The inclusion of RSS technology serves the function of simplifying site maintenance and message initiation. Once sites have been designed and published, RSS code embedded in these pages can be accessed from any RSS-capable device.
- A community marketing campaign may be necessary to populate the site. Class and student registration are apt times for publicity of the profile.
- The responsibility of creating the site can fall to anyone – for more advanced graphics/webpage set-up, this responsibility may fall to IT. Communications, however, should retain the responsibility of maintaining the site and making any changes.
- Social networking is not meant to serve as a definitive method for university emergency communications. Several approaches may be necessary to maximize results. The inclusion of social networking, however, provides a quick solution that is simple and cheap to implement; staff time for design and maintenance is minimal. By including social networking methods now, a university may achieve a greater ability to reach its students, teachers and staff, parents and community, should a crisis arise tomorrow.

VII. REFERENCES

Albanesius, Chloe, "Study: Sex Offenders Use Chat Rooms, Not Facebook," *PCMag.com*, (20 February 2008),

<http://www.pcmag.com/article2/0,1759,2265571,00.asp?kc=PCRSS03069TX1K0001121>.

Alexa.com (14 March 2008), <http://www.Alexa.com>.

Burns, David, CEM, Director of Emergency Management, UCLA, Personal Interview, 30 October 2007.

Burton, Fred, "The Virginia Tech Shootings: A Case For Redundant Systems," *Stratfor.com* (17 April 2007), http://www.stratfor.com/virginia_tech_shootings_case_redundant_communications.

Carvin, Andy. "Yet Another Wakeup Call For Better Emergency Preparedness," *PBS*, (18 April 2007), http://www.pbs.org/teachers/learning.now/2007/04/virginia_tech_yet_another_wake.html.

Cohen, Jody S. and Torriero, E.A., "Up-To-The-Minute Messaging System Put ToThe Test," *Chicago Tribune Online* (15 February 2008), www.chicagotribune.com/news/local/chi-niu-security_15feb15,0,6664175.story.

Cleary, Tom, "VirginiaTech Shooting Advances Discussions of Fairfield Security," *Fairfield Mirror Online* (26 April 2007), <http://media.www.fairfieldmirror.com/media/storage/paper148/news/2007/04/26/News/Virginia.Tech.Shooting.Advances.Discussion.Of.Fairfield.Security-2879678.shtml>.

"Definition: Bandwidth," *Createawebsite.com* (12 March 2008), <http://www.createafreewebsite.net/bandwidth.html>.

Fark.com [Blog on Internet] "Shooting Confirmed at Virginia Tech," Fark.com Blog, comments posted on 16 April 2007, <http://forums.fark.com/cgi/fark/comments.pl?IDLInk=2742309>.

Gouveia, Pedro de, "The Four Most Popular Social Networking Sites," *Bizcommunity.com* (12 March 2008) <http://www.bizcommunity.com/Article/196/16/20623.html>.

Hauser, Christine and O'Connor, Anahad, "Virginia Tech Shooting Leaves 33 Dead," *New York Times Online* (16 April 2007), <http://www.nytimes.com/2007/04/16/us/16cnd-shooting.html>.

Joly, Karine, "After Two Dorms Were Destroyed By A Tornado and Its Website Went Down, Union University Relies On Blogs and Its Facebook Page For Its Online Emergency Communications," *College Web Editor*, (6 February 2008), www.collegewebeditor.com/blog/index/php/archives/2008/02/06/after-2-dorms-were-destroyed-by-a-tornado-and-its-website-went-down-union-university-relies-a-blog-and-its-facebook-page-for-its-online-emergency-communications.

Kirkpatrick, Marshall, "Top 10 Social Networking Sites See 47% Growth," *The Social Software Web Blog*, (17 May 2006), <http://socialsoftware.weblogsinc.com/2006/05/17/top-10-social-networking-sites-see-47-growth/>.

Mckay, Jim, "Early Warning," *Govtech.com* (21 Nov 200), <http://www.govtech.com/em/206151>.

"New Leahy Bill Targets Internet "Phishing" and "Pharming" That Steal Billions of Dollars Annually From Consumers," Senate Statement Transcript, www.leahy.senate.gov (28 February 2008), <http://leahy.senate.gov/press/200503/030105.html>.

Nie, Norman H. and Erbring, Lutz, *Internet and Society: A Preliminary Report*, Stanford Institute For the Quantitative Study Of Society, 17 February 2000.

Powazek, Jack, Vice Chancellor of General Services, UCLA, Personal Interview, 6 March 2008.

Salaway, Gail, Caruso, Judith Borreson, Nelson, Mark R., and Dede, Chris, "The ECAR Study of Undergraduate Students and Information Technology, 2007," *Educause Center for Applied Research Volume 6 (2007)* <http://www.educause.edu/ir/library/pdf/ers0706/rs/ERS0706w.pdf>.

Scott, Katie, "Myspace Puts Child Protection Measures In Place," *Pocket-Lint.Co.Uk*, (15 January 2008), <http://www.pocket-lint.co.uk/news/news.phtml/12263/13287/MySpace-unveils-child-protection-measures.phtml>.

Slevin, Peter and Lydersen, Kari, "Gunman at Illinois College Kills 5 Students, Wounds 16," *Washington Post Online* (15 February 2008), <http://www.washingtonpost.com/wp-dyn/content/article/2008/02/14/AR2008021402647.html?sid=ST2008021402970>.

"Social Networking Sites, A Haven for Identity Thieves," *TrustedID.com* (5 March 2008), https://www.trustedid.com/html/identity_theft_protection_resource_013.php.

Tchilingirian, Jack, UCLA General Services, Computing Resource Manager, Phone Interview, 6 March 2008.

"Technology Helped Virginia Tech Students Connect After Tragedy," *Online News Hour Transcript, PBS*, Aired 18 April 2007. http://www.pbs.org/newshour/bb/science/jan-june07/vatech_04-18.html.

"Viral Marketing," *Wikipedia.org*, (5 March 2008), http://en.wikipedia.org/wiki/Viral_marketing.

"What is RSS?," www.Softwaregarden.com Inc, (28 April 2008).